DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed April 25, 2011. Claim 10 is amended. Claim 21 was previously cancelled. Claims 1-20 are pending and are rejected finally for the reasons given below.

Claim Objections

2. The objection to claim 10 is withdrawn in light of the amendment.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Faita et al. (US 5,578,388).

Faita et al. teach a membrane fuel cell delimited by bipolar plates and having anodic and cathodic compartments (abstract, column 1 lines 10-12). The compartments have means for feeding air and fuel (Figure 3). As to the direction of flow, this is relative to the orientation of the fuel cell. Specifically, Faita et al. teach reactant channels, which are means for feeding air and fuel. The relative directions of the flow of fuel or air depend on the orientation of the fuel cell.

The compartments comprise porous flow distributors of the gaseous reactants (abstract).

As for claim 2, the flow distributors are in both compartments (abstract).

Regarding claim 3, the flow distributors are made of reticulated material, mesh material, or expanded sheets (column 8 lines 62-67; column 9 lines 25-39).

As for claim 8, Faita et al. teach heat exchange within the cell (column 5 lines 64-65). The cooling liquid is provided through calibrated holes in the bipolar plates (column 6 lines 18-20).

With regard to claim 9, Faita et al. teach a stack of cells (Figure 6).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faita et al. as applied to claim 1 above, and further in view of Fan et al. (US 6,627,035).

The teachings of Faita et al. as discussed above are incorporated herein.

Faita et al. teach a porous flow distributor in the cathodic compartment but fail to teach the claimed porosity and pressure variation. Faita et al. teach that the void ratio of the flow distributors should be such that the flow of reactants and percolation of water is permitted (column 10 lines 12-16).

Regarding claims 4 and 5, Fan et al. teach a desired pressure variation in the gas diffusion layer, of flow distributor, of less then 12 inch water, or 0.03 bar (Figure 4).

It would be advantageous to minimize pressure variation within the flow distributor such as taught by Fan et al. in the flow distributor of Faita et al., since such minimization would ensure that the air pressure would be even across the cathode electrode, maximizing efficiency of the fuel cell.

As for claims 6 and 7, the skilled artisan would recognize that, since the material of Faita et al. is the same as the claimed material, if the flow pressure variation is minimized such as taught by Faita et al., the claimed porosity would inherently be needed.

Therefore, it would have been obvious to the skilled artisan to have the flow distributor of Faita et al. having the claimed pressure variation and porosity in light of the teachings of Fan et al.

7. Claims 10-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faita et al. as applied to claim 1 above, and further in view of Stute et al. (2003/0232231) and Brambilla et al (WO 00/63992)..

The teachings of Faita et al. as discussed above are incorporated herein.

Regarding claims 10 and 11, Faita et al. fail to teach the pressure at which the air is fed into the cathodic compartment.

Stute et al. teach air pressure fed to a fuel cell at pressure less than 2.5 bar ([0020]). Stute et al. further teach that air pressure is desirably minimized in order to minimize the amount of power required to supply air to the fuel cell without affecting the output of the fuel cell ([0020]).

It would have been obvious to the skilled artisan to minimize the input air pressure of Faita et al. such as taught by Stute et al. for the reasons discussed above.

As for claims 12 and 13, Faita et al. inherently teach these limitations since the skilled artisan will easily recognize that the temperature of a fuel cell is regulated for these reasons by adjusting the temperature of the cooling fluid.

Regarding claims 14 and 15, the relative position of the coolant passages is dependent on the orientation of the fuel cell.

As for claim 16, see the discussion of claim 8 above.

With regard to claim 19, Faita et al. teach the use of pumps to regulate operations in the fuel cell (column 1 line 25).

With further regard to claim 10, Faita et al. in view of Stute et al. fail to teach that the provided air is dry.

Brambilla et al. teach humidification of air to a bipolar fuel cell having reticulated flow distributors, of bipolar plates, within the cell (page 6 line 25 to page 7 line 4). Thus, the air provided is inherently dry.

As for claims 17, 18, and 20, Brambilla et al. teach that the water flow rate is regulated in order to maximize electrical output (page 17 lines 9-10).

It would have been obvious to the skilled artisan to operate the fuel cell of Faita et al. in the method taught by Brambilla et al. since the method of Brambilla et al. allows for the regulation of the fuel cell output.

Response to Arguments

8. Applicant's arguments filed April 25, 2011 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the counter-current flow of reactants) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993)

On page 7 of the Remarks, Applicant argues that Faita et al. do not teach "means for feeding air from the bottom to the top" or "means for feeding a hydrogen-containing fuel from the top to the bottom." The examiner finds that Faita et al. teach means for feeding the reactant gases through channels (9) (Figure 2). The flow, from "bottom to top" or "top to bottom" depends on the orientation of the stack.

It appears that Applicant is arguing that Faita et al. do not teach the relative flow of the reactants such as illustrated in instantly filed Figure 1; however, the examiner finds that this structure is not claimed by claim 1.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula Ruddock can be reached on 571-272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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